PROJECT INFORMATION

TOWER TOP SOW:

POSITION FOUR:
REMOVE EXISTING ANTENNA IN POSITION 4 OF EACH SECTOR, AND REPLACE WITH NEW 4' ANDREW SBNHH-1D65A HEX; ADD (3) RRUS 32 RADIOS TO NEW HEX UP TOP

GROUND SOW:
ADD (2) B14 4478 RADIOS TO GROUND WITH (8) SURGE ARRESTORS – (ALPHA AND GAMMA SHARE, BETA GETS OWN); ADD (3) 4478 B5 RADIOS TO GROUND WITH (12) SURGE ARRESTORS; SWAP BB WITH (1) 5216; ADD (1) XMU; ADD (1) 6630

– LTE GAMMA IS WITH UMTS ALPHA DUE TO AZIMUTHS – HAVE CDS CALL OUT EACH ANTENNA SPECIFICALLY. REMOVE (3) UMTS RRUS BELOW (MAY NEED TO RECONFIG THE UMTS CABINET) TO MAKE SPACE FOR BOTTOM RRUS.

SITE ADDRESS:	310 THOMPSON ROAD WEBSTER, MA 01570
COUNTY:	WORCESTER
LATITUDE: LONGITUDE:	42.0298919° -71.8583000°
TOWER HEIGHT:	190'
RAD CENTER:	175
TOWER OWNER:	SBA
AT&T CONSTRUCTION MGR:	BILL FURDOCK (315) 447-0746
CENTERLINE PROJECT MGR:	PETER LAMONTAGNE (508) 341-7854
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

AT&T

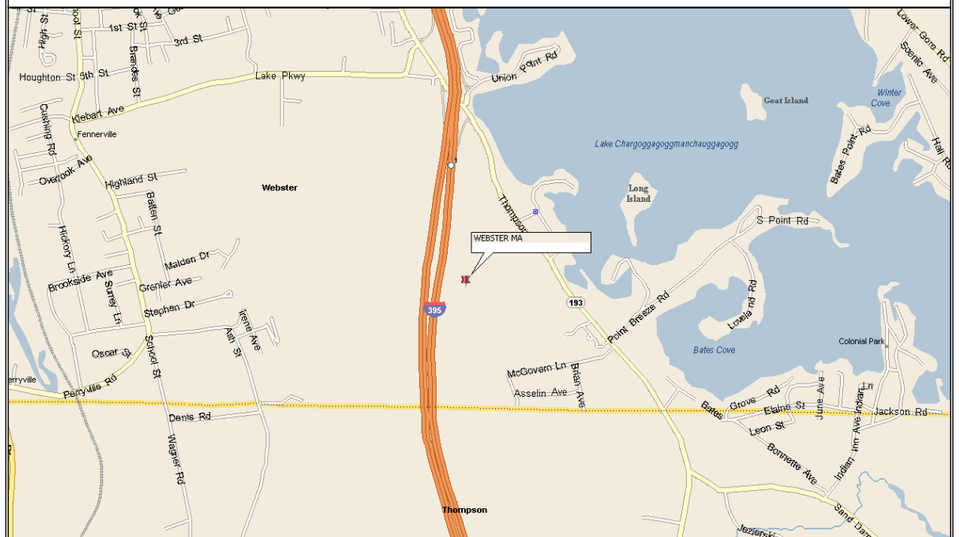
SITE NAME: WEBSTER THOMPSON RD (MA3318)

SITE NUMBER: MA3318

PACE ID: LTE 2C: MRCTB030839; LTE 3C: MRCTB031697; LTE 4C: MRCTB031938

PROJECT: LTE 2C/3C/4C UPGRADE

VICINITY MAP



NO SCALE

DRAWING INDEX

SHEET #	SHEET DESCRIPTION	REV. #
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GENERAL NOTES

1. THE FACILITY IS AN UNMANNED, PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC, ROUTINE MAINTENANCE, AND THEREFORE, DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
2. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING IF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
3. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

DRIVING DIRECTIONS

DIRECTIONS TO SITE:
DEPART LOGAN INTERNATIONAL AIRPORT ON SERVICE RD, ROAD NAME CHANGES TO FRANKFORT ST, TURN LEFT ONTO NEPTUNE RD, ROAD NAME CHANGES TO RT-145, TAKE RAMP ONTO RT-1A, KEEP STRAIGHT ONTO I-90, AT EXIT 10, TURN RIGHT ONTO RAMP, TAKE RAMP ONTO I-395, AT EXIT 1, TURN RIGHT ONTO RAMP, KEEP LEFT TO STAY ON RAMP, TURN LEFT ONTO RT-193, TURN RIGHT ONTO ACCESS ROAD.

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BEFORE YOU DIG!

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AT&T

CENTERLINE COMMUNICATIONS

MA3318

WEBSTER THOMPSON RD (MA3318)

310 THOMPSON ROAD
WEBSTER, MA 01570

PROJECT NO:	127426.002.01
CHECKED BY:	RPS

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	10/10/18	JDP	CONSTRUCTION
1	10/24/18	GEH	PLATFORM ORIENT.
2	10/30/18	RFC	CLIENT REDLINES
3	10/31/18	GEH	CLIENT REDLINES
4	11/12/18	GEH	CLIENT REDLINES

B&T ENGINEERING, INC.

COMMONWEALTH OF MASSACHUSETTS
JOHN W. KELLY II
STRUCTURAL
No. 47005
REGISTERED
PROFESSIONAL ENGINEER
11/12/18

SHEET NUMBER:	REVISION:
T-1	4

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI OR MFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDING TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GE'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER VONDING CONDUCTORS IN ACCORDANCE WITH NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS AND 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLDED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDED FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTINGS HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BASE TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   - CONTRACTOR: CENTERLINE
   - SUBCONTRACTOR: GENERAL CONTRACTOR (CONSTRUCTION)
   - CONTRACTOR: AT&T MOBILITY
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR, ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY, SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH LTE SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES".
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND IN HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:

    SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

    BUILDING CODE: IBC 2015

    ELECTRICAL CODE: NEC 2017

    SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

    AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

    AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

    MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

    TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-G, STRUCTURAL STANDARDS FOR STEEL

    EQUIPMENT AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	(P)	PROPOSED	TYP	TYPICAL
(E)	EXISTING	NTS	NOT TO SCALE	UG	UNDERGROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

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CENTERLINE COMMUNICATIONS

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WEBSTER THOMPSON RD (MA3318)

310 THOMPSON ROAD
WEBSTER, MA 01570

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CHECKED BY:	RPS

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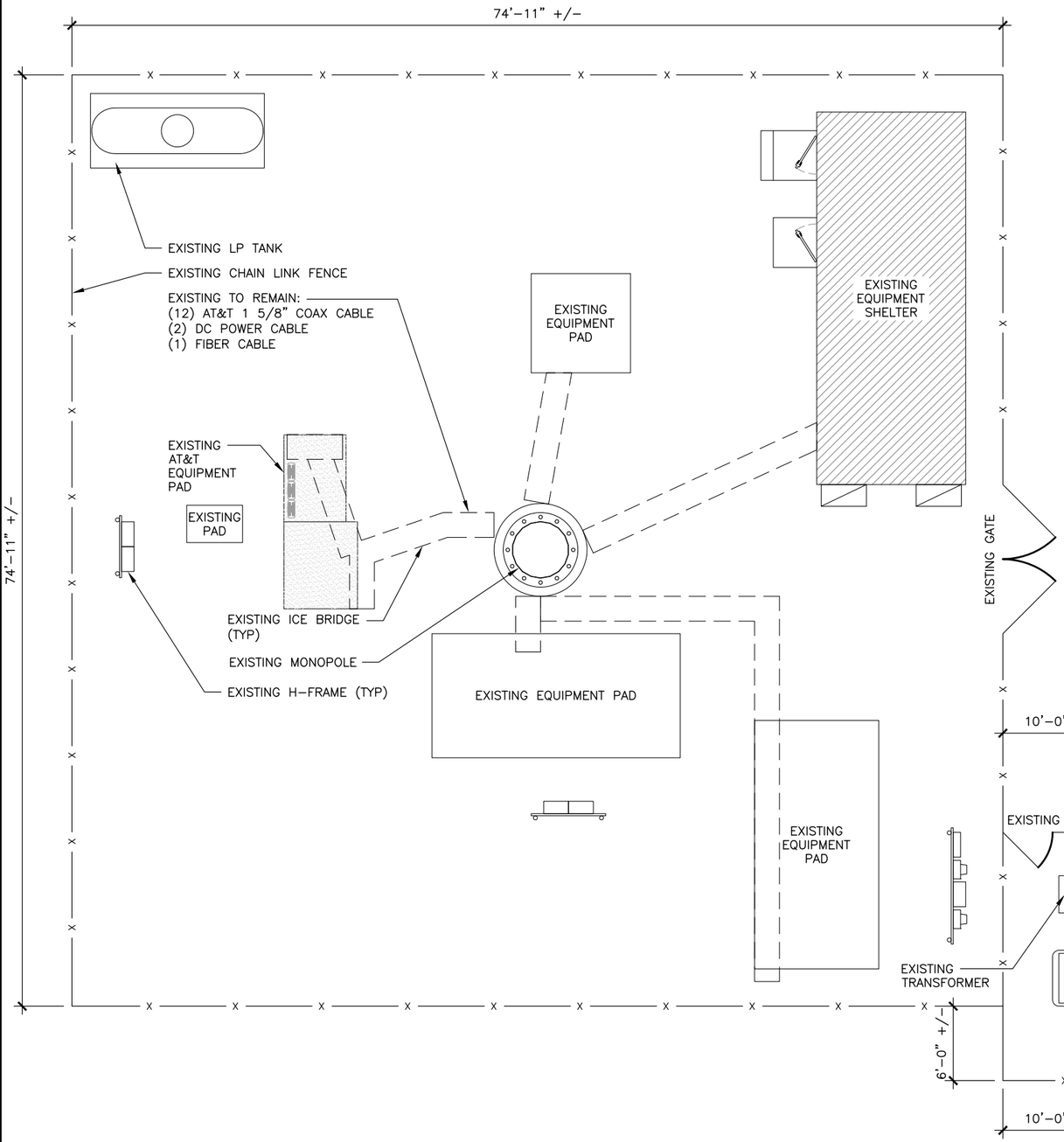
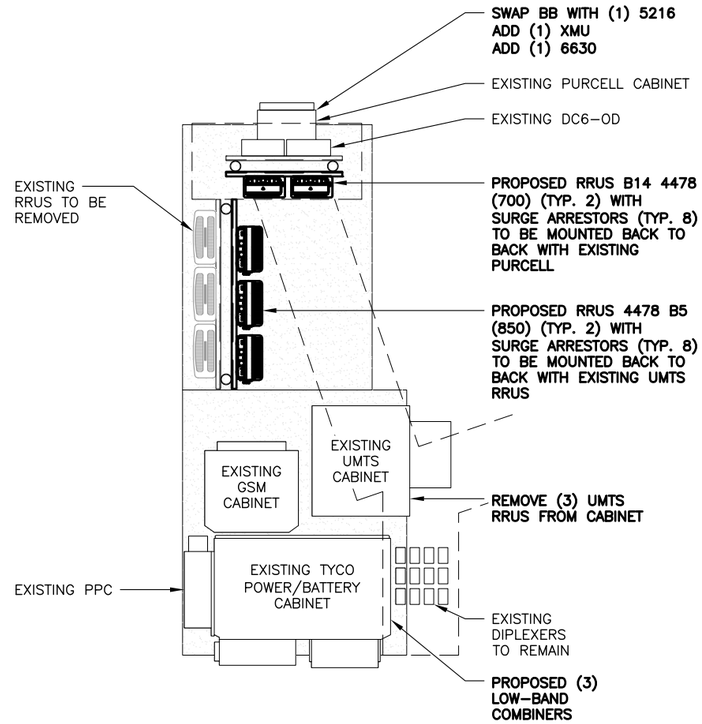
B&T ENGINEERING, INC.

COMMONWEALTH OF MASSACHUSETTS
JOHN W. KELLY III
STRUCTURAL
No. 47005
REGISTERED
PROFESSIONAL ENGINEER
11/12/18

SHEET NUMBER: GN-1
REVISION: 4





1 OVERALL SITE PLAN
SCALE: 0' 4' 8' 16' 32'

N
TRUE NORTH

2 EQUIPMENT PLAN
SCALE: 0' 1' 2' 4' 10'

N

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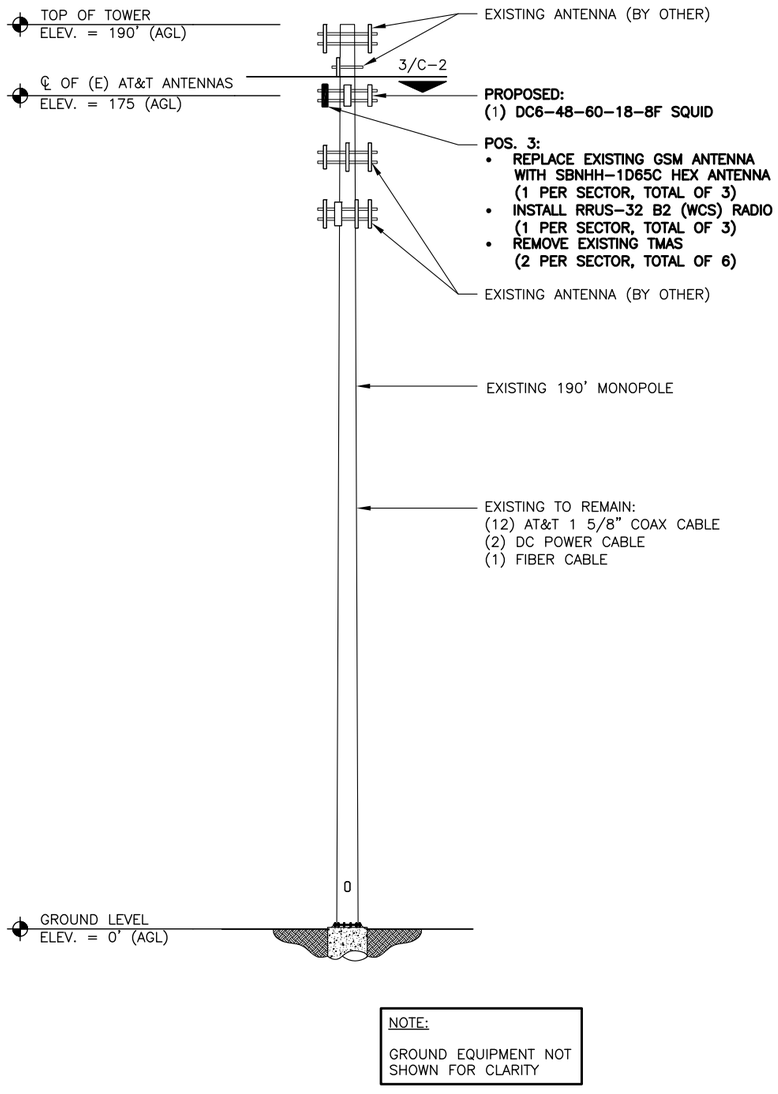
COMMONWEALTH OF MASSACHUSETTS
JOHN W. KELLY II
STRUCTURAL
No. 47005
REGISTERED PROFESSIONAL ENGINEER
11/12/18

SHEET NUMBER: A-1
REVISION: 4

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
AN ANALYSIS FOR THE CAPACTIY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY B+T GROUP DATED 11/26/18.

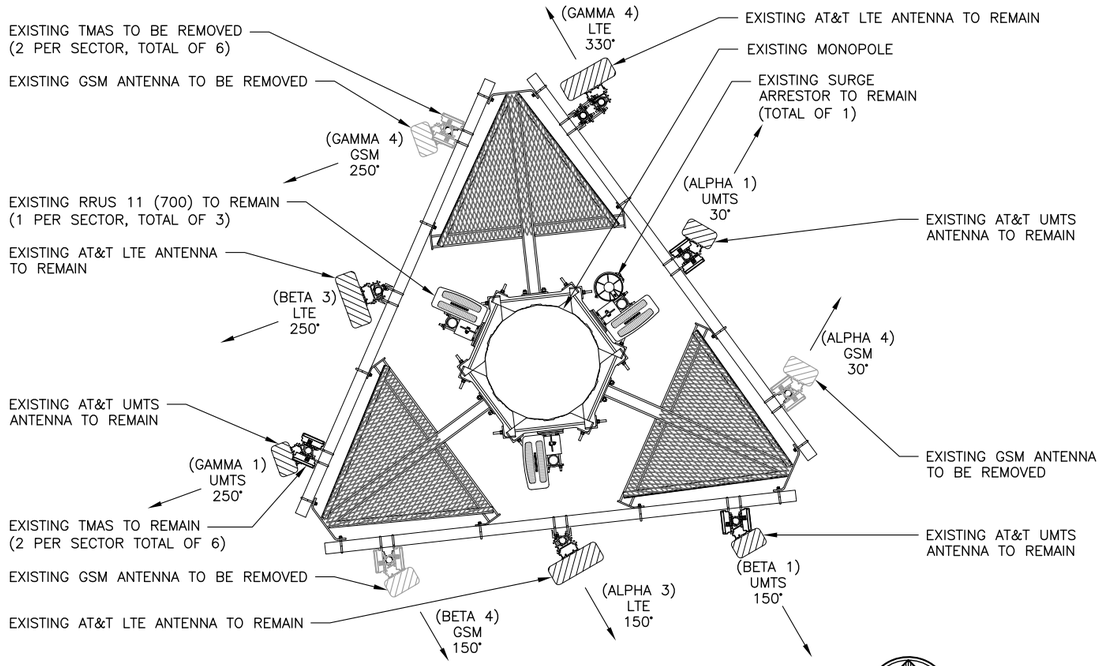


NOTE:

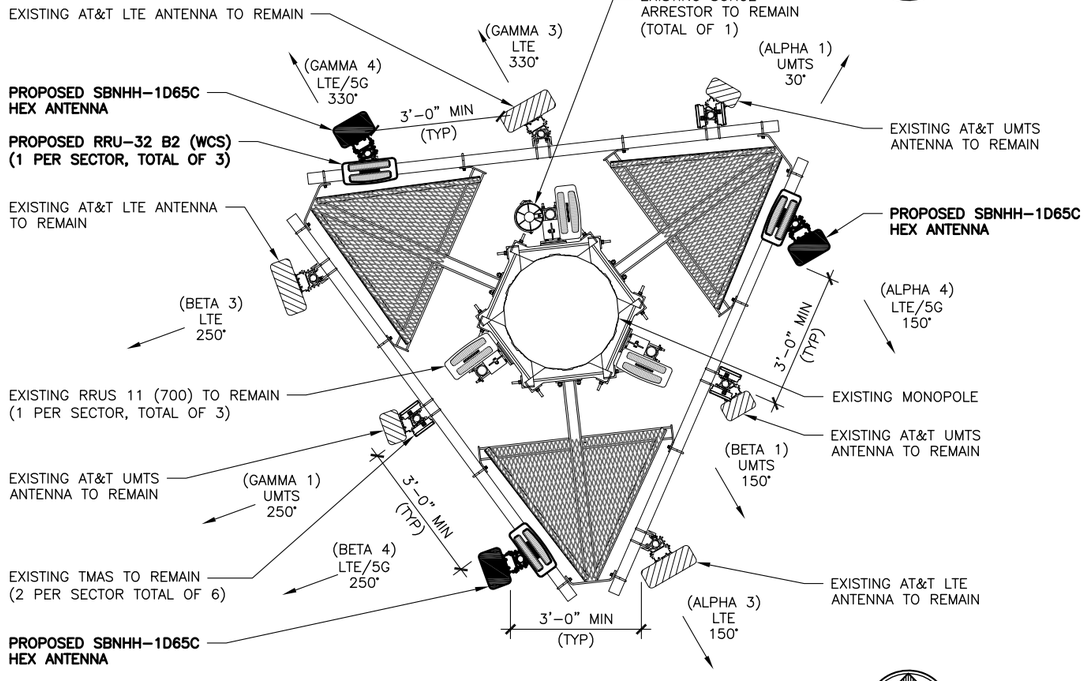
GROUND EQUIPMENT NOT SHOWN FOR CLARITY

1 FINAL TOWER ELEVATION
SCALE: N.T.S.

LEGEND:
NEW
EXISTING



2 EXISTING ANTENNA ORIENTATION
SCALE: N.T.S.



3 FINAL ANTENNA ORIENTATION
SCALE: N.T.S.

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B&T ENGINEERING, INC.

SHEET NUMBER:	REVISION:
A-2	4

*FIBER JUMPER NOTE:

FIBER JUMPERS (1) PER SECTOR
TOTAL OF (3) TO RRU. SINGLE PAIR
POWER CABLE #12 SIZE FROM SQUID
TO EACH RRU.

**COAX JUMPER NOTE:

COAX JUMPERS
(TYP. OF 2 PER SECTOR)
FROM THE RRU (TOTAL OF 6)

ANTENNA SCHEDULE

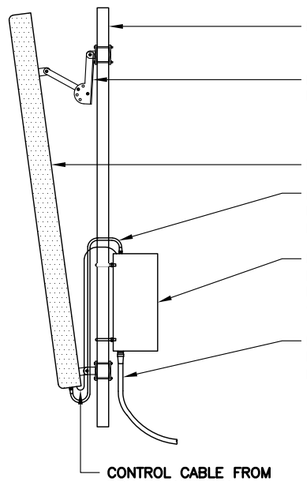
SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	ANTENNA ℄ HEIGHT	AZIMUTH	TMA/DIPLEXER	RRU	FEEDER	RAYCAP
A1	EXISTING	UMTS 850	800-10121	±175'	30°	(2) POWERWAVE LGP21901 (2) POWERWAVE LGP17201	–	(2) 1 5/8 COAX	–
A3	EXISTING	LTE 700	P45-16-XLH-RR	±175'	150°	–	(E) (1) RRUS-11	–	(E) (1) RAYCAP DC6-48-60-18-8C
A4	**PROPOSED**	**LTE 700/850/WCS 5G 850**	**SBNHH-1D65A**	**±175'**	**150°**	**(2) DBCT108F1V92-1**	**(P) (1) B14 4478 (AT GRADE) (P) (1) 4478 B5 (AT GRADE) (P) (1) RRUS-32**	(2) 1 5/8 COAX	–
B1	EXISTING	UMTS 850	800-10121	±175'	150°	(2) POWERWAVE LGP21901 (2) POWERWAVE LGP17201	–	(2) 1 5/8 COAX	–
B3	EXISTING	LTE 700	P45-16-XLH-RR	±175'	250°	–	(E) (1) RRUS-11	–	–
B4	**PROPOSED**	**LTE 700/850/WCS 5G 850**	**SBNHH-1D65A**	**±175'**	**250°**	**(2) DBCT108F1V92-1**	**(P) (1) B14 4478 (AT GRADE) (P) (1) 4478 B5 (AT GRADE) (P) (1) RRUS-32**	(2) 1 5/8 COAX	–
C1	EXISTING	UMTS 850	800-10121	±175'	250°	(2) POWERWAVE LGP21901 (2) POWERWAVE LGP17201	–	(2) 1 5/8 COAX	–
C3	EXISTING	LTE 700	P45-16-XLH-RR	±175'	330°	–	(E) (1) RRUS-11	–	–
C4	**PROPOSED**	**LTE 700/850/WCS 5G 850**	**SBNHH-1D65A**	**±175'**	**330°**	**(2) DBCT108F1V92-1**	**(P) (1) 4478 B5 (AT GRADE) (P) (1) RRUS-32**	(2) 1 5/8 COAX	–

ALPHA/GAMMA SECTORS WILL SHARE
PROPOSED RRUS-4478 B14

1 FINAL ANTENNA CONFIGURATION TABLE

SCALE: N.T.S.

NOTE:
8" MINIMUM SEPARATION NEEDED
BETWEEN ANTENNAS AND EQUIPMENT



PIPE MOUNT

**DOWNTILT BRACKET.
INSTALL PER MFG. SPECS.**

PROPOSED ANTENNA

**PROPOSED JUMPER CONNECTION, (TYP)
MAINTAIN MIN. BEND RADIUS,
PER MANUFACTURER'S SPECIFICATIONS**

**PROPOSED RRH TO BE INSTALLED
BEHIND ANTENNA (TYP)
REFER TO RF SHEET FOR
QUANTITY & LOCATION**

**PROPOSED JUMPER FROM RAYCAP
MAINTAIN MIN. BEND RADIUS,
PER MANUFACTURER'S SPECIFICATIONS**

**CONTROL CABLE FROM
RRH TO ANTENNA**

MOUNT ANTENNA IN ACCORDANCE
WITH MANUFACTURER'S
RECOMMENDED PROCEDURE

2 ANTENNA MOUNT DETAIL

SCALE: N.T.S.

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B&T ENGINEERING, INC.

COMMONWEALTH OF MASSACHUSETTS
JOHN W. KELLY II
STRUCTURAL
No. 47005
REGISTERED PROFESSIONAL ENGINEER
11/12/18

SHEET NUMBER:	REVISION:
A-3	4

NOTES:

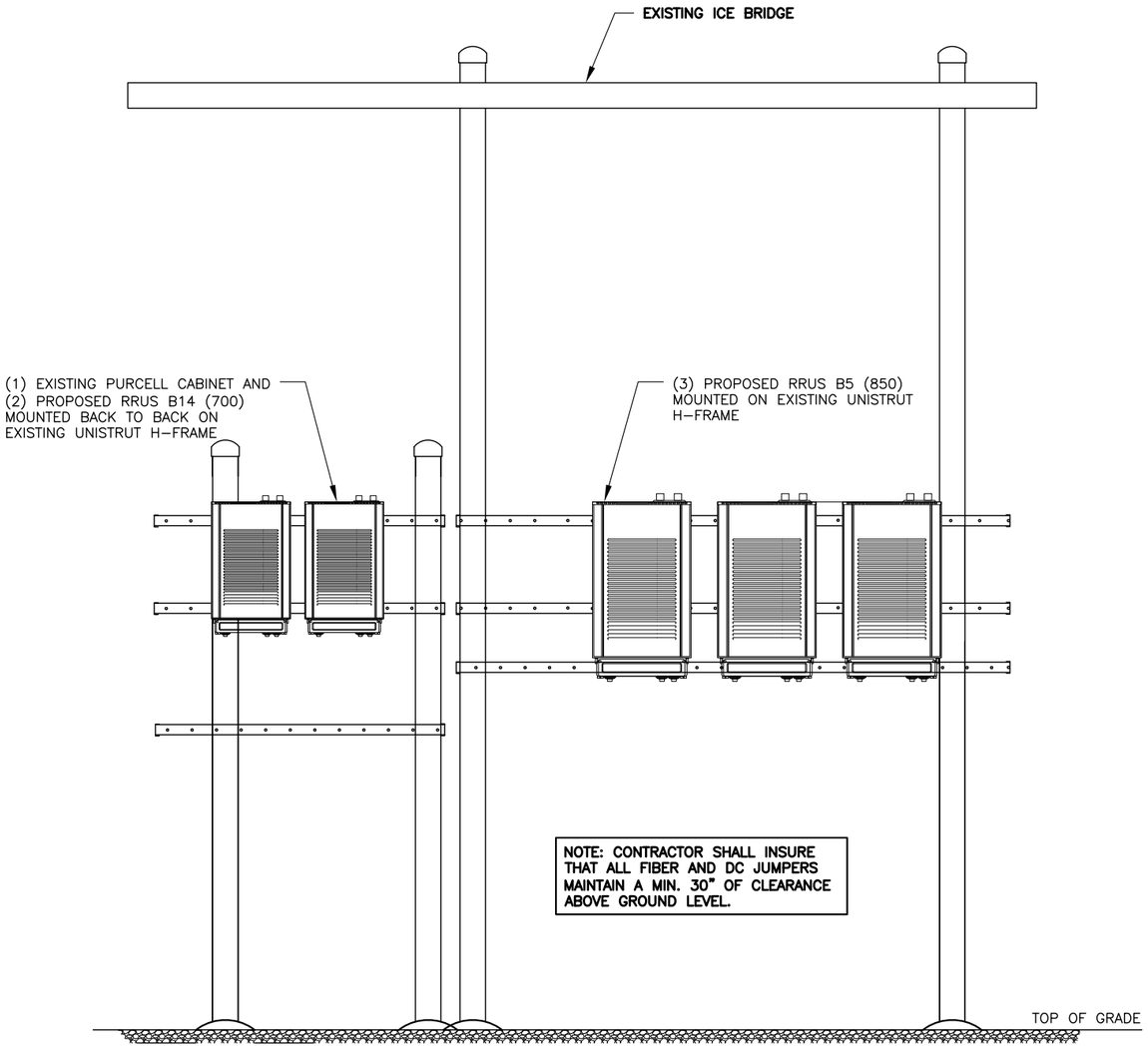
1. NOKIA VIA AT&T SUPPLIES THE RRH. SUBCONTRACTOR SHALL SUPPLY ALL OTHER MATERIALS AND INSTALL ALL MOUNTING HARDWARE. ALU INSTALLS RRH AND MAKES CABLE TERMINATIONS.

2. A SUPPORT FOR A SINGLE RRH SHALL HAVE A MINIMUM OF TWO ANCHORS/FASTENERS FOR EACH UNISTRUT CHANNEL.

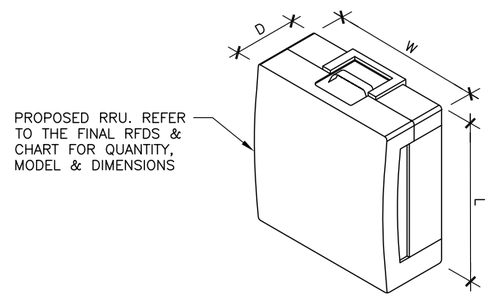
3. INSTALL ANCHORS/FASTENERS A MAXIMUM OF 2'-0" ON CENTERS.
   - WOOD STUDS – 1/4"ø LAG BOLT W/ 1" EMBEDMENT IN WOOD
   - CONCRETE – 1/4"ø HILTI KWIK BOLT III W/ 1-1/2" EMBEDMENT OR APPROVED EQUAL
   - THROUGH BOLT – 1/4"ø A36/A307 THREADED ROD W/ NUTS AND WASHERS
   - MASONRY – 1/2"ø HILTI HY20 W/6" EMBEDMENT ANCHORS AND UNISTRUT CHANNEL SHALL HAVE HOT-DIPPED GALVANIZED FINISH.

4. MOUNT RRH TO UNISTRUT WITH 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET. SUBCONTRACTOR SHALL SUPPLY.

5. NO PAINTING OF THE RRH OR SOLAR SHIELD IS ALLOWED.



1 RRH TO ICE BRIDGE POST MOUNTING DETAIL
SCALE: N.T.S.



RRU CHART				
QUANTITY	MODEL	L	W	D
3 (E)	RRUS-11	19.7"	17.0"	7.2"
3 (E)	RRUS-32	27.2"	12.1"	7.0"
2 (P)	B14 4478	18.1"	13.4"	8.26"
3 (P)	4478 B5	16.5"	13.4"	7.7"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

3 RRU DETAIL
SCALE: N.T.S.

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CENTERLINE COMMUNICATIONS

MA3318

WEBSTER THOMPSON RD (MA3318)

310 THOMPSON ROAD
WEBSTER, MA 01570

PROJECT NO:	127426.002.01
CHECKED BY:	RPS

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	10/10/18	JDP	CONSTRUCTION
1	10/24/18	GEH	PLATFORM ORIENT.
2	10/30/18	RFC	CLIENT REDLINES
3	10/31/18	GEH	CLIENT REDLINES
4	11/12/18	GEH	CLIENT REDLINES

B&T ENGINEERING, INC.

COMMONWEALTH OF MASSACHUSETTS
JOHN W. KELLY II
STRUCTURAL
No. 47005
REGISTERED
PROFESSIONAL ENGINEER
11/12/18

SHEET NUMBER: A-4
REVISION: 4

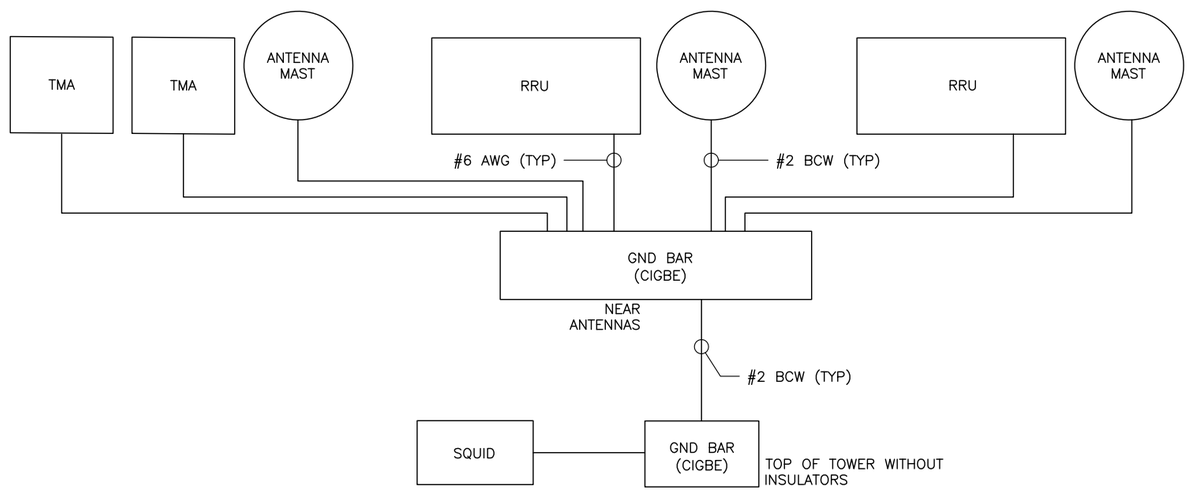
COAX COLOR CODING AND IDENTIFICATION NOTES

1. SECTOR ORIENTATION/AZIMUTH WILL VARY FROM REGION TO REGION AND IS SITE SPECIFIC. REFER TO RF REPORT FOR EACH SITE TO DETERMINE THE ANTENNA LOCATION AND FUNCTION OF EACH TOWER SECTOR FACE.
2. THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE EXCEPT IN LOCATIONS WHERE ENVIRONMENTAL CONDITIONS CAUSE PHYSICAL DAMAGE, THE PHYSICAL TAGS ARE PREFERRED.
3. THE STANDARD IS BASED ON 8 COLORED TAPES – RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE, AND VIOLET. THESE TAPES MUST BE 3/4" WIDE & UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR SUBCONTRACTOR ON SITE.
4. USING COLOR BANDS ON THE CABLES, MARK ALL RF CABLE BY SECTOR AND CABLE NUMBER AS SHOWN ON "CABLE MARKING COLOR CONVENTION TABLE".
5. WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN GSM/3G AND IS–136/TDMA IS ENCOUNTERED, THE SUBCONTRACTOR SHALL REMOVE THE EXISTING COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING AND TAGGING STANDARD THAT IS OUTLINED IN THE CURRENT VERSION OF ND–00027, IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME, OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THE GUIDELINE SHALL BE IMPLEMENTED AT THE SITE REGARDLESS OF TECHNOLOGY.
6. ALL COLOR CODE TAPE SHALL BE 3M–35 AND SHALL BE INSTALLED USING A MINIMUM OF 3 WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID UNRAVELING.
7. ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM OF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE BETWEEN EACH COLOR.
8. ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE TO SIDE.
9. IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE GSM TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

CABLE MARKING TAGS

WHEN USING THE ALTERNATIVE LABELING METHOD, EACH RF CABLE SHALL BE IDENTIFIED WITH A METAL ID TAG MADE OF STAINLESS STEEL OR BRASS. THE TAG SHALL BE 1 1/2" IN DIAMETER WITH 1/4" STAMPED LETTERS AND NUMBERS INDICATING THE SECTOR, ANTENNA POSITION, AND CABLE NUMBER. THE ID MARKING LOCATIONS SHOULD BE AS PER CABLING MARKING LOCATIONS TABLE. THE TAG SHOULD BE ATTACHED WITH CORROSION PROOF WIRE AROUND THE CABLE AT THE SAME LOCATION AS DEFINED ABOVE. THE TAG SHOULD BE LABELED AS SHOWN ON THE GSM AND UMTS LINE TAG DETAIL.

CABLE MARKING LOCATIONS TABLE	
#	LOCATIONS
1	EACH TOP JUMPER SHALL BE COLOR CODED WITH 1 SET OF 3" WIDE BANDS
2	EACH MAIN COAX SHALL BE COLORED RED WITH 1 SET OF 3" WIDE BANDS NEAR THE TOP JUMPER CONNECTION AND WITH 1 SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS FOR THE TRANSMITTER BUILDING
3	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER
4	ALL BOTTOM JUMPERS SHALL BE COLORED WITH 1 SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPERS



1 SCHEMATIC DIAGRAM GROUNDING SYSTEM (TYPICAL PER SECTOR)
SCALE: N.T.S.

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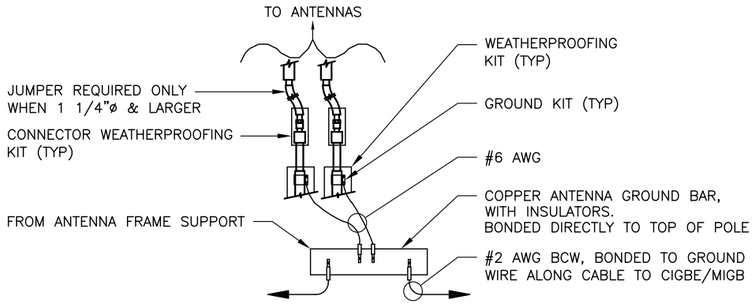
11/12/18

SHEET NUMBER: A-5
REVISION: 4

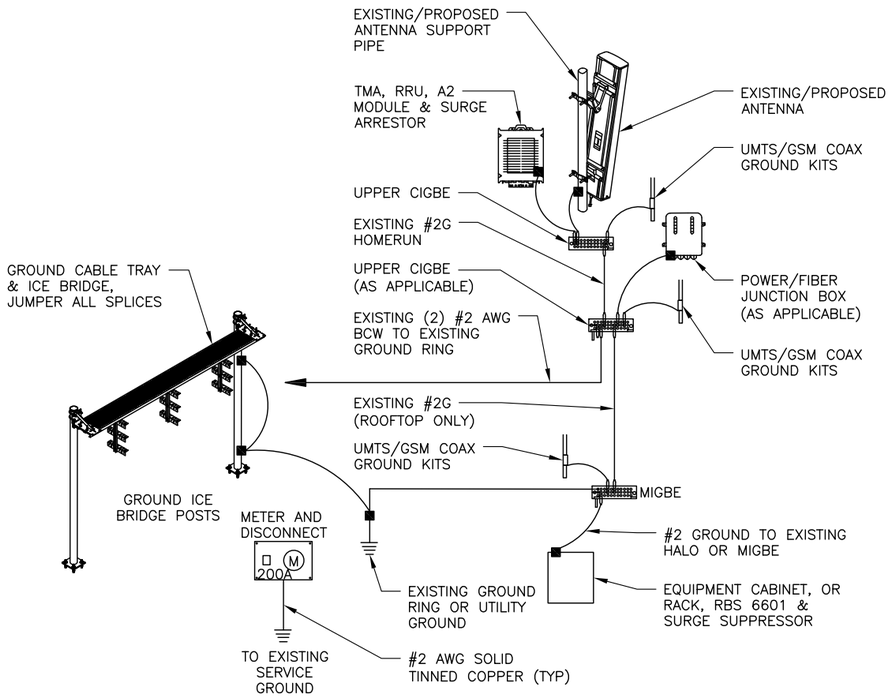


NOTES:
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GIGBE.

WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

1 GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



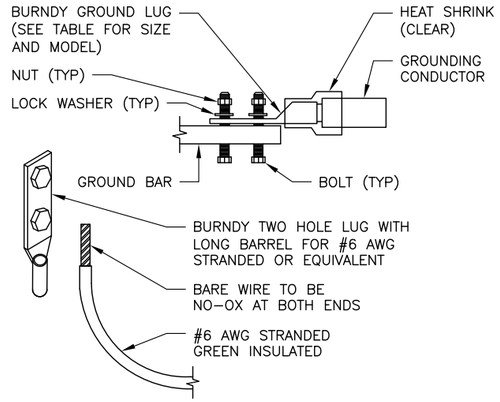
2 GROUNDING RISER DIAGRAM

SCALE: N.T.S.

WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT

NOTES:

1. "DOUBLING UP" OR "STACKING" OF CONDUCTORS IS NOT PERMITTED.
2. OXIDE INHIBITING COMOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.



3 TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.

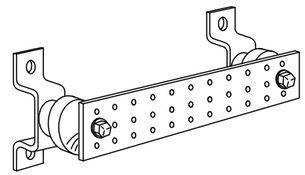
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IUDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" - SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES

SECTION "A" - SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)



4 GROUND BAR DETAIL

SCALE: N.T.S.

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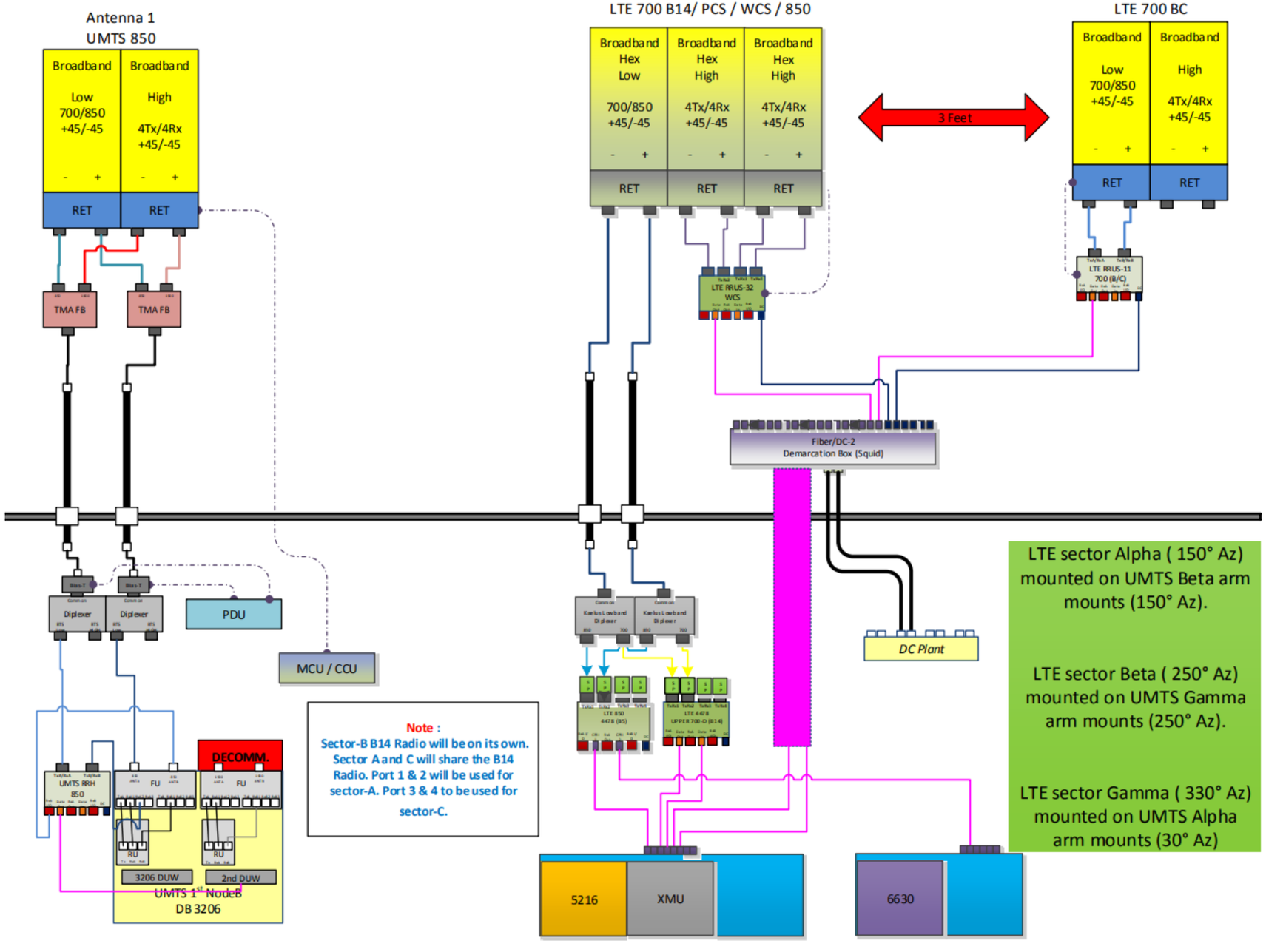
REGISTERED PROFESSIONAL ENGINEER
11/12/18

SHEET NUMBER:	REVISION:
G-1	4

LTE 2C/3C/4C UPGRADE



Note :
Sector-B B14 Radio will be on its own. Sector A and C will share the B14 Radio. Port 1 & 2 will be used for sector-A. Port 3 & 4 to be used for sector-C.

LTE sector Alpha (150° Az) mounted on UMTS Beta arm mounts (150° Az).

LTE sector Beta (250° Az) mounted on UMTS Gamma arm mounts (250° Az).

LTE sector Gamma (330° Az) mounted on UMTS Alpha arm mounts (30° Az)

1 PLUMBING DIAGRAM
SCALE: N.T.S.

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RF-1	4